DOCUMENT RESUME

ED 091 979 HE 005 535

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TITLE Postdoctoral Education at the University of California, San Diego.
PUB DATE 73
NOTE 48p.

EDRS PRICE MF-$0.75 HC-$1.85 PLUS POSTAGE
DESCRIPTORS Educational Finance; *Higher Education; *Institutional Research; *Post Doctoral Education; *Program Costs; *Program Evaluation; Research Projects; Resource Allocations
IDENTIFIERS *University of California San Diego

ABSTRACT

This paper presents the results of a comprehensive study of postdoctoral education at the University of California, San Diego (UCSD). The purpose of the study was to determine the basic facts about postdoctoral education at UCSD, so that those entrusted with academic, administrative, and legislative responsibilities regarding postdoctoral education could better cope with associated problems. The findings include: (1) Of the 214 postdoctorals identified, 54% are in the physical and biological sciences, 36% in the health sciences, 6% in mathematics and engineering sciences, and 4% in humanities and social sciences. (2) Principal investigators and department chairmen involved in postdoctoral education feel strongly that postdoctorals should be recognized as a part of faculty workload and included in resource allocation and planning activities. (3) The estimated level of magnitude cost to the university for supporting postdoctoral education is $500,000, or an annual average per scholar of $3,600 in the health sciences and $1,500 in the nonhealth sciences. (Author)

ED 091979

POSTDOCTORAL EDUCATION

at the

UNIVERSITY OF CALIFORNIA

San Diego

A comprehensive study to determine the basic facts about postdoctoral education at UCSD so that those entrusted with academic, administrative and legislative responsibilities regarding postdoctoral education can better cope with associated problems.

by

Thomas E. Robinson

Office of the Assistant Chancellor - Planning

Spring 1973

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1. Of the 214 postdoctorals identified, 54% are in the Physical and Biological Sciences, 36% in the health sciences, 6% in Mathematics and Engineering Sciences, and 4% in Humanities and Social Sciences.

2. Principal investigators and department chairmen involved in postdoctoral education feel strongly that postdoctorals should be recognized as a part of faculty workload and included in resource allocation and planning activities and that a strong postdoctoral program should be developed and maintained at UCSD.

3. The estimated level-of-magnitude cost to the University for supporting postdoctoral education is one-half million dollars, or an annual average per scholar of $3,600 in the health sciences and $1,500 in the non-health sciences.

I. INTRODUCTION

It has been evident for many years that UCSD is perennially endowed with a relatively large number of postdoctoral scholars. Not until recently, however, has the size of this postdoctoral population been quantified. Based on a June 1973 census, there are 214 postdoctorals at UCSD. The true magnitude of this number is evident when it is compared to the corresponding figures at other institutions known to have large postdoctoral populations.[1] (See Table 1)

In the spring of 1973, the Office of the Assistant Chancellor - Planning initiated a study of postdoctoral education at UCSD, responding to interest expressed by faculty and administration. The purpose of the study was to determine the basic facts about postdoctoral education at UCSD so as to: 1) provide those entrusted with academic administrative and legislative responsibilities the insight necessary to cope with perceived problems, 2) inform all participants, particularly the postdoctoral appointee and the faculty mentor, of the actual situation in which they are involved, and 3) provide a basis for assessing costs and financial uncertainties associated with postdoctoral education at UCSD.

This paper presents the results of that study. It is not a position paper, but rather a descriptive evaluation to serve as a basis of understanding upon which future plans for postdoctoral education at UCSD can be based.

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1 The Invisible University, National Academy of Sciences, 1969, p. 20.

TABLE 1. POSTDOCTORAL CENSUS [1]

	Professional Schools	Health Sciences	General Campus	Total
UC, Los Angeles	189	161	184	534
UC, Berkeley	N/A[2]	120	377	497
UC, San Diego	Ø	75	139	214
Stanford [3]	59	232	131	422
Cal Tech [4]				209

[1] All figures except Berkeley are based on 1973 census as obtained via direct conversations with the institutions. Of those contacted, Columbia, Harvard, Cornell, Princeton, and the University of Chicago were unable to respond, as no central records are maintained.

[2] Figures based on 1968 NAS study adjusted for growth and incomplete counting. Professional school figures cannot be broken out and are reported under General Campus.

[3] Includes only those not paid on the University payroll. Those on the payroll are small in number, in the opinion of the Dean of Graduate Studies.

[4] Breakout by discipline area is not available. Number refers to "Research Fellows" and is a fairly comprehensive account of true postdoctoral population, in the opinion of the Dean of Graduate Studies.

II. BRIEF HISTORY

Postdoctoral education has been the subject of fluctuating national interest over the last five years. Of particular note, however, is a 1968 study entitled The Invisible University, sponsored by the National Academy of Sciences (NAS). A large-scale national survey, the NAS study aimed at describing the general character of postdoctoral education in the United States, and raised key questions concerning the future of that activity.

Within the University of California (UC), a follow-up of the NAS study was conducted between 1968 and 1970 by the Joint Academic Senate-Administration Ad Hoc Committee on Postdoctoral Education. The latter study concentrated on the UC portion of the data generated by the larger NAS study. The UC study was in turn reviewed by the UCSD Committee on Educational Policy and a group of faculty advisors, and their findings transmitted in 1970 to William McGill, then Chancellor at UCSD.

The need for the current study was underscored by a keen interest expressed by a new administration at UCSD, coupled with reduced federal funding of postdoctoral education and the need to define more clearly the postdoctoral population at UCSD.

III. STUDY OUTLINE

The study employed questionnaires directed at three elements of the academic community: postdoctoral scholars, principal investigators, and department chairmen. The questionnaires requested both demographic and attitudinal information, and were developed in coordination with the Office of Graduate Studies and

Research (OGSR), the Vice Chancellor for Academic Affairs, the Chancellor, and other academic and administrative offices. The postdoctorals and principal investigators to be surveyed were identified through an OGSR postdoctoral scholar reporting system recently established at UCSD.

The remainder of this report presents the findings of the survey. The responses of the three academic groups cited above are discussed individually and supported by tables presented at TABS A, B, and C for postdoctorals, principal investigators, and department chairmen, respectively. The narrative concentrates on attitudinal information, only highlighting the demographic and other statistical data that can more easily be gleaned from the tables. A detailed listing of supplementary comments and responses to attitudinal questions is provided at TAB D. The final section of the narrative is a cost analysis. As postdoctoral appointments in the health vs. non-health sciences constitute two distinct groups, these elements are reported separately throughout the study and referenced as either Medical School or General Campus [including Scripps Institution of Oceanography (SIO)], respectively. Comparative references to the 1968 NAS study and a 1972 study entitled Post-Doctoral Education in the Ontario Universities, 1969-70 [2] are made throughout the report.

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2 Study by L. C. Payton, Council of Ontario Universities, Toronto, 1972.

IV. STUDY FINDINGS

A. Postdoctoral Scholars (TAB A: Tables Ia-o)

In consonance with the NAS study, postdoctorals at UCSD are heavily concentrated in a few departments. On the General Campus, Chemistry, Biology and Physics account for 70% of the postdoctoral population. Similarly, at the Medical School 72% of the postdoctorals are associated with the departments of Neurology, Pediatrics and Medicine. The scholars are primarily male (87%) and of U.S. citizenship (66%), although the Medical School has a greater proportion of females (22% vs. 8% at the General Campus), and the General Campus has a greater proportion of foreign scholars (43% vs. 17% at the Medical School).

The following results pertain only to those postdoctorals responding to the questionnaire. However, considering the distribution of responses over the departments with greatest postdoctoral densities (Table Ia), the results are reflective of the overall postdoctoral population.

On the average, the postdoctoral estimated his or her length of stay at UCSD to be 1.5 years, although 18% stated that they were yet undecided. The postdoctoral ranks include a substantial portion of scholars with appointments at other institutions (24% overall, 15% General Campus and 39% Medical School). On the average, the postdoctoral's salary expressed as a percentage of that of a faculty member with equivalent experience is 85% for the General Campus and 45% for the Medical School.

In choosing to pursue postdoctoral education, the scholars responding were guided most heavily by a desire to work with a particular mentor, and to gain further research experience. Approximately 80% of the scholars list University

employment as their career aspiration. (The NAS study reported similar findings). In selecting UCSD, the major factors cited were the opportunity to work with eminent scholars, geographic location, and freedom to work in a chosen field. The value of postdoctoral experience at UCSD is highly rated, with 88% of the General Campus postdoctorals and 76% of the Medical School postdoctorals rating it as "good to excellent".

A substantial majority of the scholars (78%) feel that teaching should be a part of the postdoctoral experience, but at the option of the scholar. Administrative experience, however, is not considered either desirable or important. A majority of postdoctorals (59% General Campus, 66% Medical School) are involved in teaching, primarily in seminars, course lectures, and laboratory and research supervision. (Similar levels of teaching involvement were reported in the NAS study.) At the General Campus, this teaching is primarily in the form of formal instruction at the undergraduate level, and both formal and informal instruction at the graduate level. At the Medical School, teaching by postdoctorals is primarily informal in nature, and covers both graduate and undergraduate instruction. (In comparison, the NAS study indicates a greater involvement in formal instruction by postdoctorals in the health sciences.)

On the average, those postdoctorals involved in teaching put in five to six hours per week in this activity. (It should be noted, however, that a wide variance in response was evidenced, with some scholars indicating as much as 15-20 hours of teaching per week.) Of all the scholars responding, the majority indicated a desire for more teaching opportunity.

Most postdoctorals have both office and laboratory space assigned to

them. However, lack of space was singled out as a special problem at the Medical School, and a good portion of all postdoctorals (20% General Campus, 26% Medical School) indicated that office space was inadequate. On the average, office and laboratory space is shared with one and four people, respectively, on the General Campus and three and seven people, respectively, at the Medical School.

The library is heavily used by postdoctoral scholars, and to a somewhat greater extent than it was used during the scholar's graduate education.

Two general points were expressed by postdoctorals in their response to the attitudinal portion of the questionnaire: first, that the experience at UCSD is rewarding and of high quality; second, that despite the positive aspects, there are still major areas in which the experience could be improved.

The most frequently cited areas of concern and related comments are:

a. stipends/finances: existence of postdoctorals is severely hindered by meager stipends and lack of support services (e.g., health and auto insurance, low-cost housing, student loans, etc.) to help overcome related financial difficulties.

b. isolation: postdoctorals are not accepted as a part of the University community; they are out of touch, with no mechanism for interaction even among fellow postdoctorals; there is a large degree of isolation between research groups, and little awareness of other research activities and interests on the campus.

c. acclimatization: there is no University or department effort to help

postdoctorals assimilate into the University environment upon arrival; this poses special problems for foreign scholars.

d. Appointment security: shifting funds make accomplishment of meaningful research difficult.

e. Inefficient use of postdoctoral's resources: lack of technical and secretarial support personnel results in postdoctorals to be used -- inefficiently -- in that capacity. Postdoctorals are not used in writing research proposals.

f. Teaching: many postdoctorals take on considerable teaching loads and feel they should be paid as salaried UC employees for this service.

In pointing out their concerns, the scholars proposed the following actions to help overcome some of the problems:

a. Finances and acclimization: develop a mechanism to establish postdoctorals as UC employees so that they might take part in support programs offered regular faculty; give low-income postdoctorals preference over unmarried students in family accommodations at the married student housing units; send an official appointment letter from the University to each postdoctoral (regardless of funding) welcoming the scholar and describing the various services available.

b. Isolation: publish a summary of current research activities for each department, listing principal investigator and including a short paragraph on the nature of the project; publish a directory of postdoctorals and distribute information explaining services and

resources available (e.g., department equipment) and means of access.

c. Appointment security: establish an agency to monitor the postdoctoral program, providing at least emergency relocation funds; initiate a placement activity, as at UC Berkeley, to receive and disburse job opportunity notices.

d. Use of postdoctoral skills: set up a mechanism to bring together postdoctorals and faculty with similar teaching interests.

B. Principal Investigator (PI) (TAB B: Tables IIa-k)

Caution is urged in using the PI responses in that the selection technique used was not random in nature. In particular, self-selection was involved to some degree in that identifying those PIs to be solicited involved a compromise between degree of postdoctoral involvement and estimated degree of cooperation. Secondly, it could be argued that of the PIs solicited, only those with strong feelings or with sufficient interest and time responded. If this were the case, the results might not reflect the true spectrum of opinion among the greater population of PIs. However, in that responses were received from 57% of the PIs indicated as having interaction with postdoctorals, and in that the distribution of these responses is fairly uniform over the departments covering the major portion of the postdoctoral population (Table IIa), it is proposed that the possible bias is small if existent at all.

At UCSD, PIs serving as mentors to postdoctorals have on the average three such scholars under their guidance. (It should be noted, however, that there

is a wide variance in the number of postdoctorals per PI, with 20% of tne PIs on the General Campus having five or more.) The PIs spend approximately 30% of their time on postdoctoral scholars (20% training and 10% administrative).

On the subject of postdoctoral training, the PIs feel strongly that teaching is an important element, while administrative experience is not.

Concerning the question of space and equipment, 98% of the General Campus PIs felt that provisions to support postdoctorals are at least adequate. At the Medical School, however, almost half of the PIs responding stated that both space and equipment provisions are poor.

General Campus PIs strongly encourage their better graduate students to do postdoctoral work. The main reason cited was further research experience, particularly with a specific senior scholar. On the average, it was felt that postdoctoral appointments should be short-term (1-3 years General Campus; 2-3 years Medical School).

The postdoctoral's effect on the quality of research was rated as "large to very large". PIs feel strongly (83% General Campus; 100% Medical School) that an increase in the area of postdoctoral education should be pursued at UCSD, although the sentiment is less strong (47% General Campus; 75% Medical School) if the increase must be at some cost to the graduate program. (In general, this was considered a difficult question to answer.) Money on the General Campus, and both space and money at the Medical School, are felt to be the major resource requirements for a significant increase in the level of postdoctoral studies at UCSD.

The PIs expressed strong feelings about the current state of postdoctoral

education at UCSD and the need for improvement. The more frequently cited areas of concern and comments are:

a. Workload: postdoctoral education should be recognized as part of the instructional and research responsibility of the University; postdoctorals should be included in formulas for calculating faculty workload, and in resource allocation and planning activities.

b. The postdoctoral as a part of the university community: postdoctorals should be treated with special deference instead of the current official indifference; postdoctorals should have privileges accorded them such as medical care, insurance plans and housing facilities. There should be a formal postdoctoral program with a suitable certificate at completion.

c. General: more research interaction should be encouraged.

d. Financing postdoctorals: there is need for change in practices from the previous period of exponential growth; partial funding for postdoctorals should be requested from State funds: stipends should be made available on a competitive basis; there should be some funding of senior research workers to allow viable research groups in universities; a specific category of "Postdoctoral Fellow" should be established to distinguish these people from junior members of the permanent research staff ("present system degrades the latter groups").

C. Department Chairmen (TAB C: Tables IIIa-o)

Of the 23 department chairmen surveyed, 18 (78%) responded. The associated departments represent 82% of the General Campus and 57% of the Medical School postdoctoral population.

The review of a potential postdoctoral's qualifications is handled differently throughout UCSD. At SIO reviews are handled by the Department Chairman or Division Director along with a senior staff committee. At the General Campus, it is the PI for large departments, and the PI and Department Chairman for small departments. At the Medical School it is primarily the Department Chairman who does the reviewing. Active files on postdoctorals are kept by SIO and the Medical School departments, while such files are not generally maintained by General Campus departments.

Looking at the role of postdoctoral scholars at UCSD, Department Chairmen indicated one to three years as an optimum length of appointment. Teaching experience is strongly felt to be a desirable and important part of postdoctoral education, but administrative experience is not.

In general, provision of space for postdoctorals is considered adequate, although to a lesser degree in the Medical School. Provision of equipment is generally rated as "adequate to good".

The postdoctoral puts only a small workload on department secretaries and supplies (non-equipment). In general, Department Chairmen feel that there exists an adequate structure at UCSD to support postdoctoral education, but inadequate administrative staff to support the structure.

The postdoctoral's contribution to the quality of research is rated very high on the General Campus and at the Medical School. The Chairmen feel strongly that stipends need to be increased, and that postdoctorals should be recognized in assessing faculty workload and in the resource allocation and planning process.

Concerning future plans for postdoctoral education at UCSD, the Chairmen agree that a strong program should be developed and maintained. Most of the Medical School Chairmen (83%) indicate that this should be done even if at some cost to the graduate program, while General Campus Chairmen are evenly divided on the question. Space and money are felt to be the major resource requirements for an increase in the level of postdoctoral studies in the various departments. (Space is a greater need for the Medical School departments than for the General Campus departments.)

Concerning the background of the most recent, full-time junior faculty appointments, 30% of the 46 appointments reported by the General Campus departments had just completed a Ph.D. elsewhere, 24% came from postdoctoral appointments elsewhere, and 20% were faculty elsewhere. Of the 30 appointments reported by the School of Medicine, 26% came from postdoctoral appointments elsewhere, 24% were faculty elsewhere, 24% had just completed an M.D. elsewhere and 20% came from the postdoctoral ranks at UCSD.

The most frequently cited areas of concern to, and comments by, Department Chairmen responding to the survey are:

a. Financing postdoctorals: many applications by highly qualified scholars who would gain immensely from a visit to UCSD are being

turned down primarily due to stipend support limitations (particularly at SIO); without relief in the near future, research staff appointments will have to be a choice between postdoctorals and technicians, clearly at the cost of the postdoctorals.

b. Workload: postdoctorals should be recognized as a part of faculty workload and taken into consideration in resource allocation and planning activities.

c. Future of postdoctoral education: formalizing a postdoctoral education program under department guidance, with administrative endorsement and minimal support could go a long way towards enhancing and expanding postdoctoral education at UCSD.

D. Costs and Benefits

It is a fact of life these days that, whether desirable or not, any analysis of higher education, especially public-supported higher education, must include a discussion of the related cost implications. As postdoctoral education is no exception, it is desirable to examine the cost associated with this activity at UCSD. The term, "cost" is used here in its broadest sense to include negative costs, i.e., benefits.

A comprehensive analysis of this activity should address both quantifiable and non-quantifiable costs. This paper was not intended to achieve, nor does it claim to have, such completeness. Rather, the following analysis restricts attention to only those quantifiable costs associated with the postdoctorals' stay at UCSD. Non-quantifiable costs associated with the postdoctorals' stay (e.g., the increased

quality of research) and the costs to society thereafter are adequately covered in the NAS study.

The following estimates are based upon gross data and some general assumptions aimed at identifying "level of magnitude" costs associated with post-doctoral education at UCSD. The estimates presented should not be taken out of context or extrapolated to situations not comparable to those outlined here. The analysis is presented, then, with a strong caution by the author as to the potential misuse of the data.

There are three elements to the quantifiable costs associated with post-doctoral education at UCSD: stipend or salary, indirect costs (i.e., overhead), and the replacement cost of teaching services performed by the scholars. The remainder of this paper is devoted to discussion of each of these elements individually, and a summary analysis of the overall implications.

a. Stipends and salaries: the actual stipend or salary awarded each postdoctoral scholar at UCSD can be identified by means of a post-doctoral scholar reporting system developed by OGSR. These data, adjusted to reflect annual levels of support, are summarized in Table 2. The $9,300 total campus (General Campus and Medical School) average salary can be compared with the $7,335 estimated for the Ontario Universities (1970) and the $8,432 estimated for UC (1968: All campuses).

   The higher average annual stipend for the General Campus ($9,700) in comparison with the Medical School ($8,800) results from a

Table 2

DISTRIBUTION OF POSTDOCTORAL STIPENDS BY LEVEL
(Annually Adjusted -- 12 months; $000)

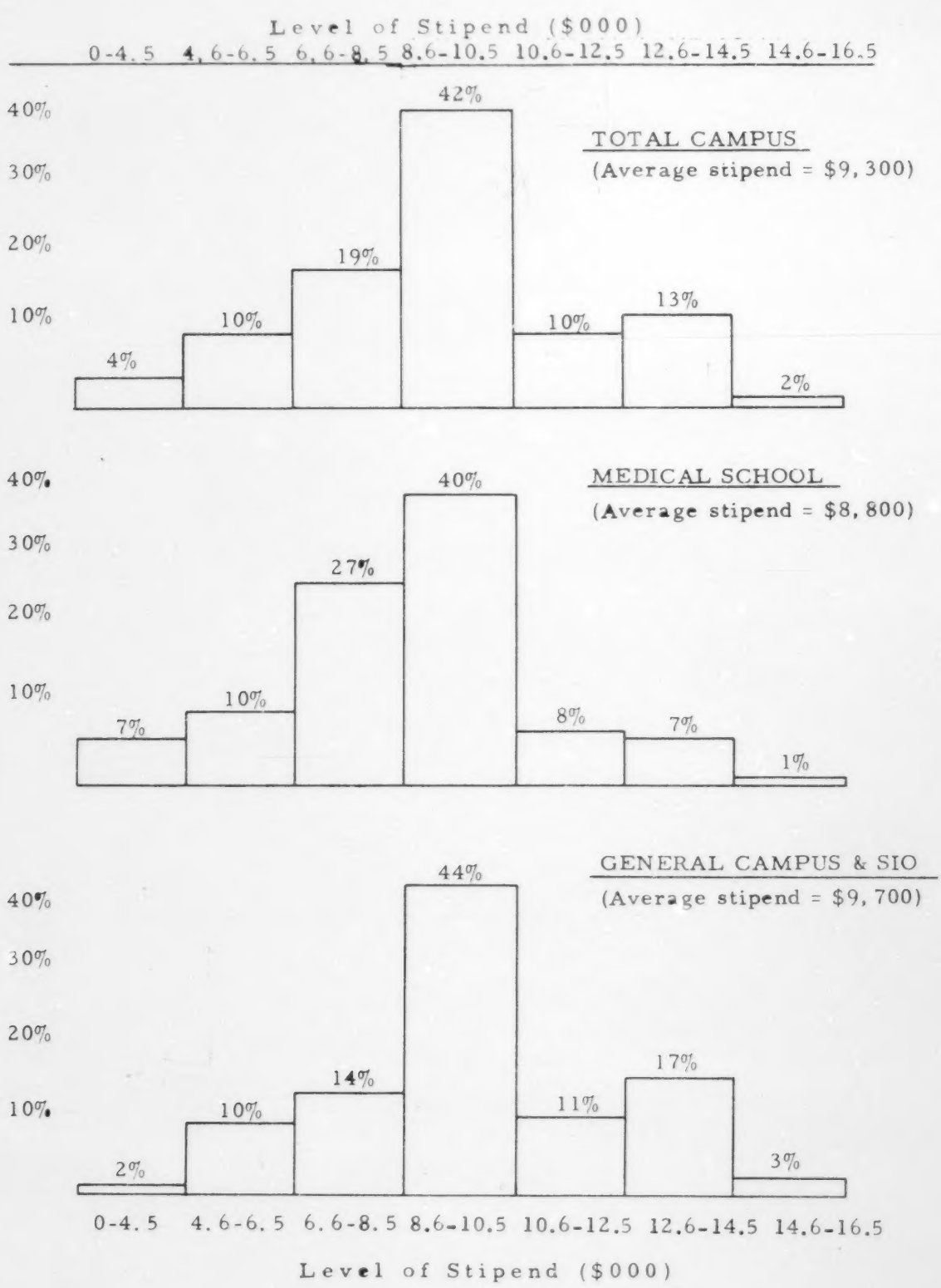
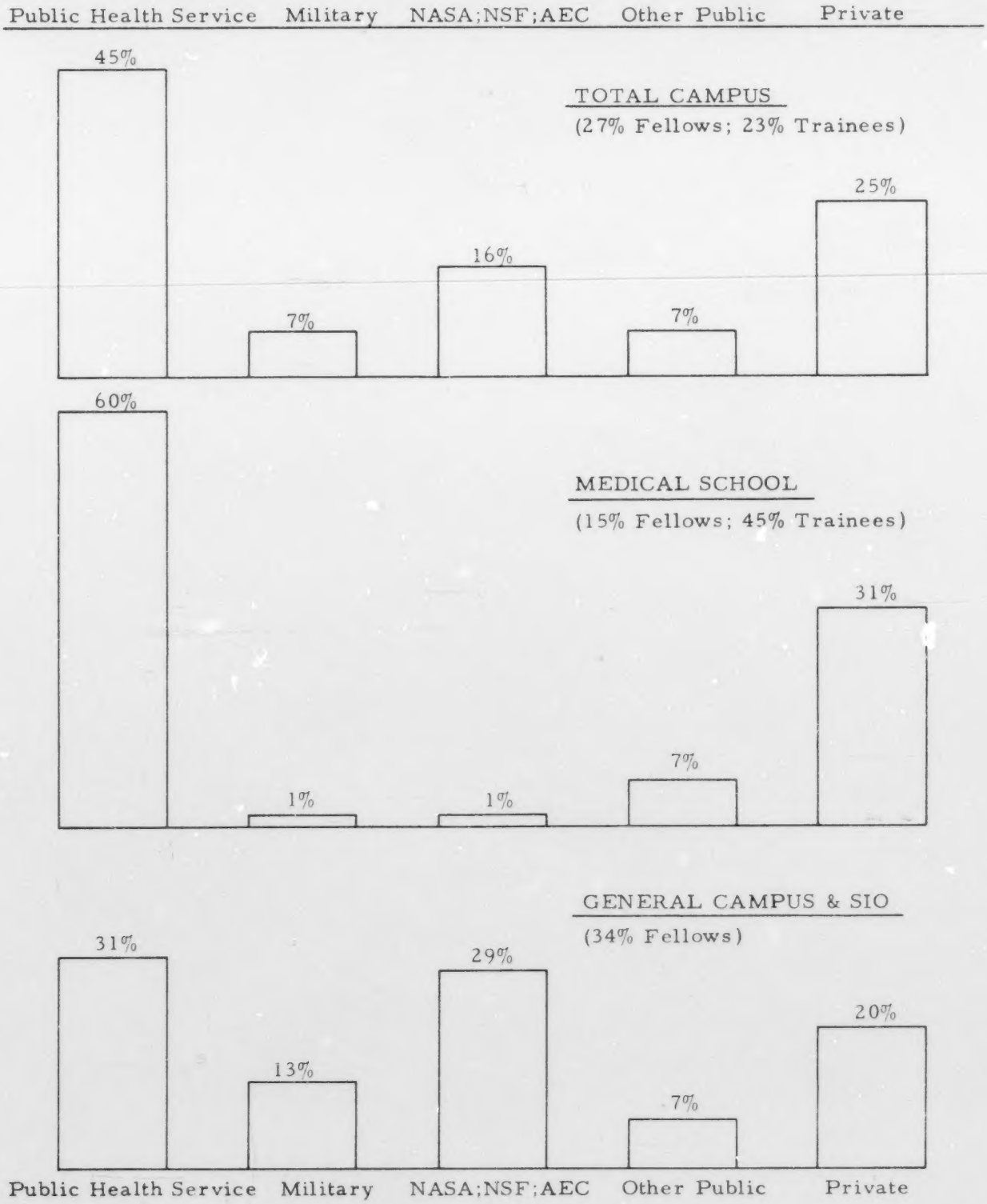


Table 3

DISTRIBUTION OF POSTDOCTORAL SCHOLARS BY FUNDING AGENCY



higher density of postdoctorals funded on federal contracts which pay at a higher level than the training grants which dominate at the Medical School. The distribution of postdoctorals by funding agency is given at Table 3.

It should be noted that some of the postdoctorals receive supplementation to their stipends. It is not clear whether supplementation is consistently included or excluded from the data in Table 2. However, discussions with department personnel indicated that supplementation is rare.

b. Indirect costs (overhead): For each of the various programs pursued by the University, there is an associated indirect cost incurred. This cost includes provisions for maintenance and operation of plant, use of buildings and general equipment, general and administrative support function, department administration, and student services. In the case of extramurally funded programs (e.g., Federal or private research and training grants), the University has developed indirect cost rates (based on analysis of historical data) which reflect the average indirect cost incurred as a proportion of direct salaries and wages. These rates are negotiated and established for certain rate periods. For the rate period to which this study pertains, the negotiated incurred indirect cost rate for on-campus research was 51.5%. (NOTE: all postdoctorals at UCSD are associated with on-campus programs.)

While most federal agencies will reimburse indirect costs at the estimated incurred rate, most non-federal sponsors will fund only partial reimbursement. In the case of fellowships, for example, there is often no indirect cost reimbursement. This partial funding approach does not reflect disagreement with the credibility or applicability of the estimated incurred rate, but rather is based on a cost sharing philosophy and a desire to fund as many grants as possible. Thus, in estimating the indirect cost associated with postdoctoral education at UCSD, it was necessary to address both the cost incurred and the cost reimbursed. The cost incurred was determined by applying the incurred cost rate (51.5%) to the total of postdoctoral stipends and salaries. The cost reimbursed was determined by identifying the funding agency of each postdoctoral stipend or salary and applying the actual reimbursement rate. The results of these calculations are presented in Table 4. Note that for the General Campus, 70% of incurred indirect costs are reimbursed, while the figure drops to 20% for the Medical School.

The higher proportion of reimbursed to incurred indirect costs for the General Campus results from a higher density of postdoctorals on federally funded contracts, which allow for full reimbursement of indirect costs. At the Medical School, 60% of the postdoctorals are funded on training and fellowship grants, the former allowing 8% reimbursement and the latter usually contributing zero reimbursement.

Table 4

COST ANALYSIS OF POSTDOCTORAL EDUCATION AT UCSD
(# Thousands)

	Average Cost per Postdoctoral Scholar		Total Cost 139 General Campus Scholars 75 Medical School Scholars	
	General Campus and SIO ($000)	Medical School ($000)	General Campus and SIO ($000)	Medical School ($000)
A. Stipends	9.7	8.8	1,348.3	660.0
B. Indirect Costs Incurred	5.0	4.5	695.0	337.5
C. Indirect Costs Reimbursed	3.5	0.9	486.5	67.5
D. Replacement of Teaching Services	2.1	2.1	291.9	157.5
1. Cost to Society (A+B-D)	12.6	11.2	1,751.4	840.0
2. Cost to Granting Agency (A+C)	13.2	9.7	1,834.8	727.5
3. Cost to University (B-C-D)	- 0.6	1.5	- 83.4	112.5
4. Cost to University: Assuming no teaching replacement cost (B-C)	1.5	3.6	208.5	270.0
5. Cost to University: Assuming payment of teaching replacement cost (B-C+D)	3.6	5.7	500.4	427.5

Again it should be emphasized that these are average figures based on gross data and general factors, and as such indicate only level of magnitude costs associated with postdoctoral education at UCSD.

c. Replacement of teaching services: As a result of the survey, it was found that 61% of the postdoctoral scholars teach an average of six hours per week, consisting of approximately two hours in lecture and four hours in lab or recitation. The scholars are not reimbursed, but we can estimate a dollar value associated with the teaching based on the assumption that additional faculty would otherwise have been hired to meet the demand.

Assume that the lecture time would be taught by an Assistant Professor, and the lab or recitation would be taught by a Teaching Assistant (TA). Further assume that the average full-time Assistant Professor teaches eight hours of lecture per week, and the average full-time TA teaches 16 hours per week. Finally, assume that one-half of the Assistant Professor's salary is to support research pursuits. (This liberal assumption will result in an admittedly conservative estimate of replacement costs.) Since the average nine-month full-time salary for an Assistant Professor is $12,500 and for a TA is $7,600, the replacement cost of teaching services per teaching postdoctoral can be estimated as follows:

$$\frac{2}{8} \times \left(\frac{1}{2} \times \$12,500\right) + \frac{4}{16} \times (\$7,600) = \$3,500$$

However, only 61% of the postdoctorals teach, thus the average replacement cost per postdoctoral scholar is: .61 x $3,500 = $2,100.

d. Summary of cost analysis: Table 4 summarizes the four cost categories included in this analysis: stipends and salaries, indirect costs incurred, indirect costs reimbursed, and replacement of teaching services. The table also includes the estimated average total cost of postdoctoral education at UCSD from various perspectives, i.e., cost to society, cost to granting agencies, and cost to the University.

The estimated cost to the University varies depending upon the basic assumptions used -- three different assumptions in this case. The first assumption is that there is a "value added" associated with the teaching services provided by the postdoctoral scholars (#3 of Table 4). The second assumption is that zero cost would be incurred if replacement of the teaching services was required (#4 of Table 4). The third assumption is that the "value added" would be the cost incurred if replacement of these teaching services were required (#5 of Table 4).

This report indicates that the cost to the University for supporting postdoctoral education, if one accepts the first "value added" assumption, is negligible (-$83,400 for the General Campus, and $112,500 for the Medical School). However, it is proposed that the zero-value-added assumption is more realistic in the sense of

resource implications. The premise here is that the teaching services provided by the scholars could be undertaken (sine scholars) using existing resources with only negligible impact upon current programs and activities. Thus, the cost to the University for supporting postdoctoral education is approximately one-half million dollars ($208,500 for the General Campus, and $270,000 for the Medical School). Again it must be emphasized that these are only level-of-magnitude estimates of the quantifiable costs associated with the postdoctorals' stay at UCSD. Non-quantifiable costs associated with the postdoctorals' stay and the costs to society thereafter are not addressed by this report, but are covered in the previously referenced NAS study.

Postdoctoral Scholar Survey:

I. Postdoctoral Scholar Questionnaire

General Campus & SIO

Medical School

a. Responses as a proportion of total postdoctoral population

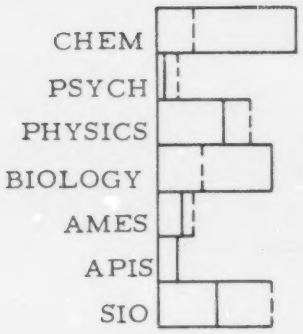
49 responses/139 scholars 35%

38 responses/75 scholars 44%

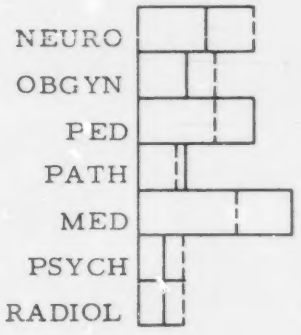
Comparison of population vs. sample densities by department

---- - sample (S)

——— - population (P)



	S	P
CHEM	12%	32%
PSYCH	4%	2%
PHYSICS	22%	14%
BIOLOGY	8%	25%
AMES	8%	6%
APIS	4%	4%
SIO	26%	12%



	S	P
NEURO	26%	15%
OBGYN	16%	9%
PED	16%	24%
PATH	8%	9%
MED	18%	33%
PSYCH	8%	4%
RADIOL	8%	4%

CHEM - Chemistry
PSYCH - Psychology
PHYSICS - Physics
BIOLOGY - Biology
AMES - Applied Mechanics and Engineering Sciences
APIS - Applied Physics and Information Science
SIO - Scripps Institution of Oceanography

NEURO - Neurology
OBGYN - Obstetrics & Gynecology
PED - Pediatrics
PATH - Pathology
MED - Medicine
PSYCH - Psychiatry
RADIOL - Radiology

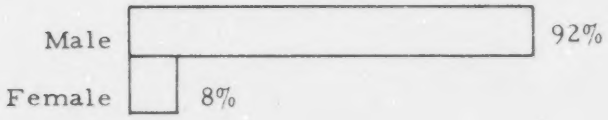
I. Postdoctoral Scholar Questionnaire (cont'd.)

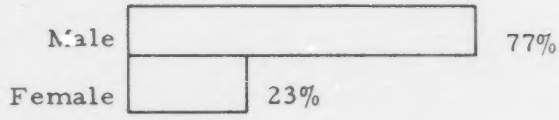
General Campus & SIO

Medical School

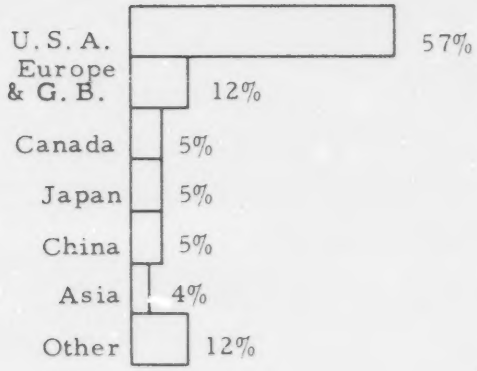
b. Distribution by Citizenship and Sex

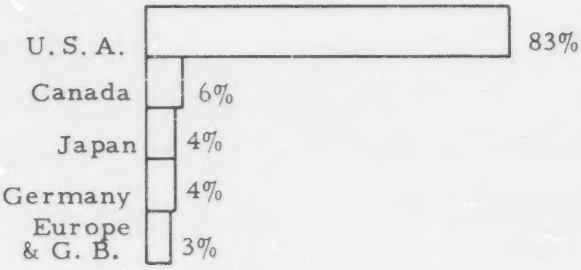
Sex



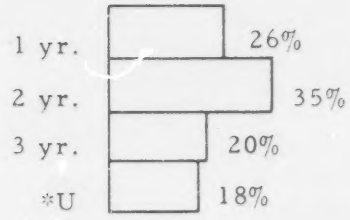


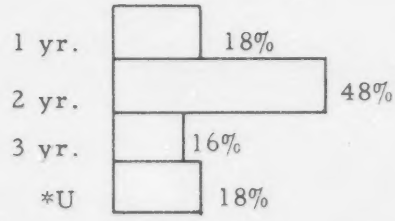
Citizenship





c. Length of Stay





* Undecided

d. Appointments at another institution

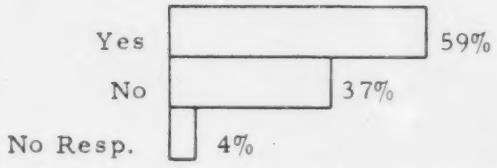
7 - 6 foreign, 1 domestic

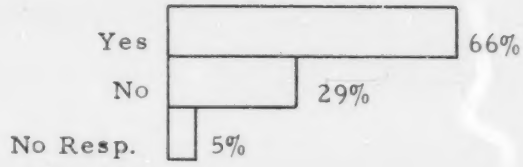
15 - 12 foreign, 3 domestic

General Campus & SIO | Medical School

I. Postdoctoral Scholar Questionnaire (cont'd.)

e. Teaching activities





Of those teaching: Level and nature of instruction.
(Multiple responses allowed)

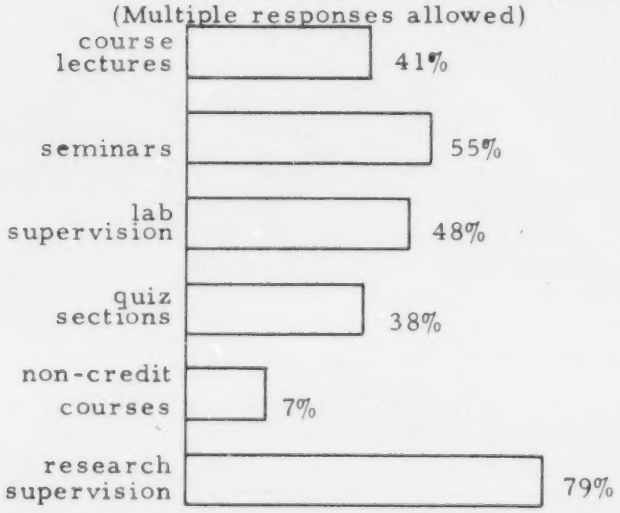
U. G.		GRAD	
F	IF	F	IF
65%	29%	44%	76%

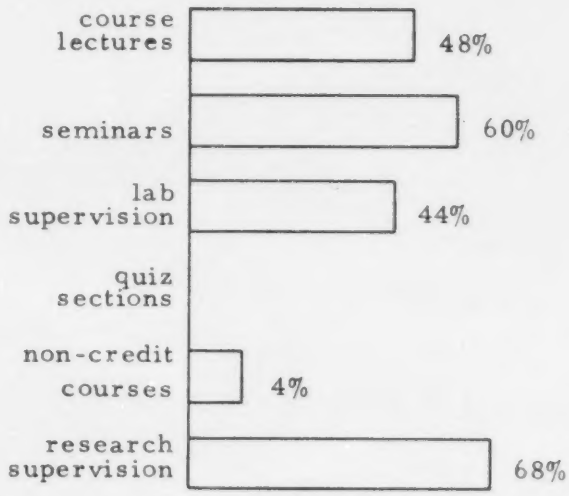
U. G.		GRAD	
F	IF	F	IF
20%	52%	28%	80%

U. G. - Undergraduate
GRAD - Graduate

F - Formal
IF - Informal

Of those teaching, % involved by type of teaching
(Multiple responses allowed)





Of those teaching: Ave. hrs/wk

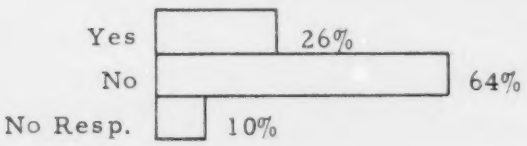
6 | 5

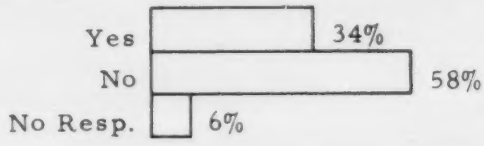
I. Postdoctoral Scholar Questionnaire (cont'd.)

General Campus & SIO | Medical School

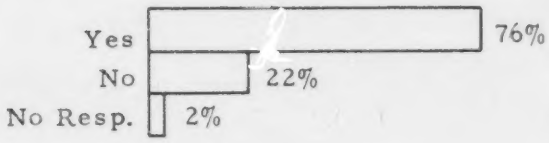
f. Administration/Teaching activities should be a part of postdoctoral program?

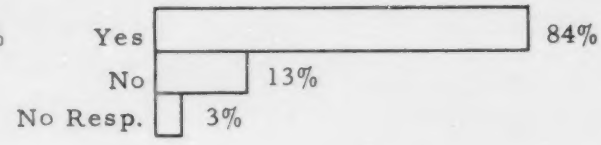
Admin.



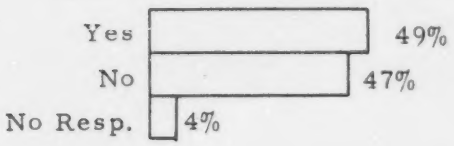


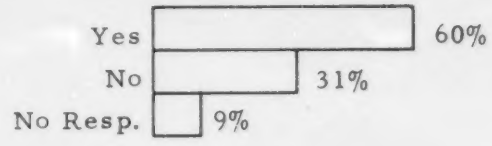
Teaching





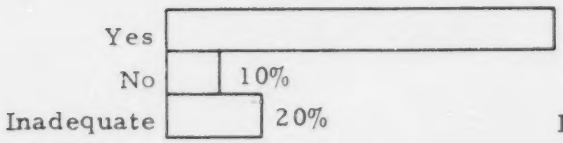
g. More teaching opportunity desired?



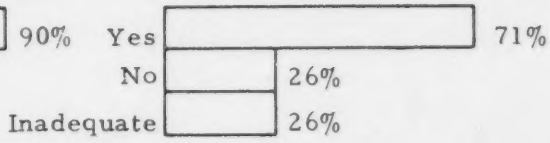


h. Space utilization

Office

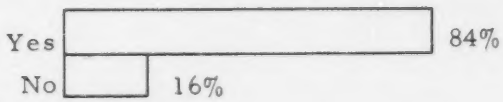


Avg. # Sharing 1 person



Avg. # Sharing 3 persons

Other



Avg. # Sharing 4 persons

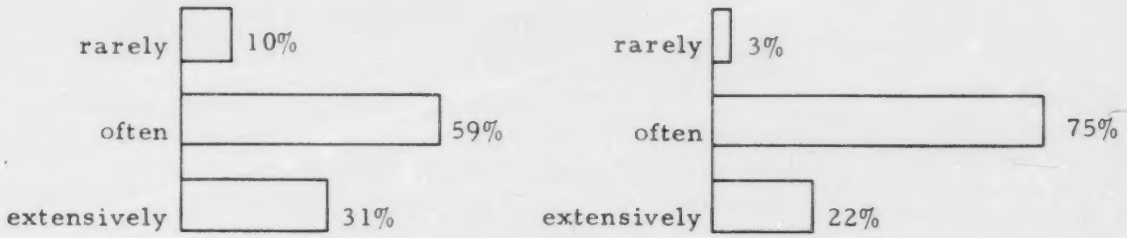
Avg. # Sharing 7 persons

I. Postdoctoral Scholar Questionnaire (cont'd.)

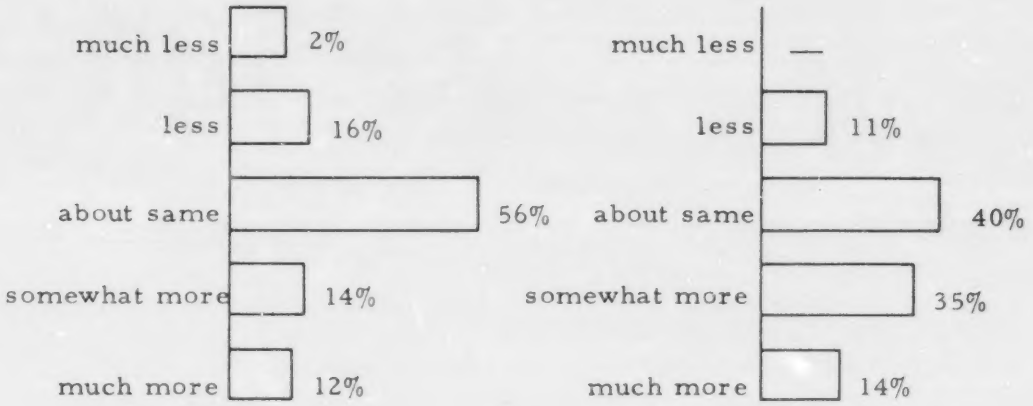
General Campus & SIO | Medical School

i. Library Utilization

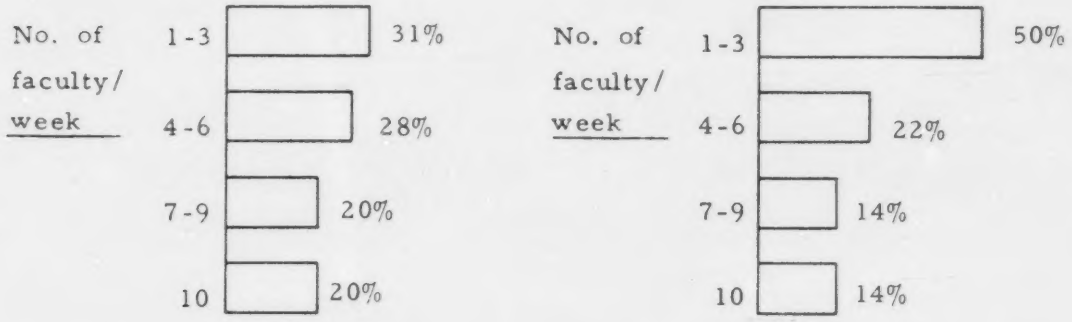
Absolute Measure



Compared to Graduate School



j. Faculty contact



I. Postdoctoral Scholar Questionnaire (cont'd.)

	General Campus & SIO	Medical School

k. Motivation in seeking postdoctoral studies

Major Factors and Frequency of Response

General Importance:	b. 61% a. 54%	b. 67% a. 39%
Greatest Importance:	a. 43% b. 35%	b. 48% a. 24%

a. To work with a particular scholar
b. To gain further research experience

l. Reasons for selecting UCSD for postdoctoral studies

	39 Responses	29 Responses

Major Factors and Frequency of Response

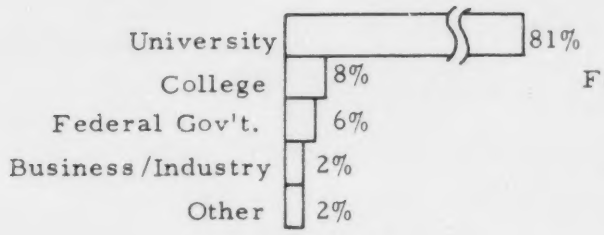
General Importance:	c. 62% f. 33% b. 30%	c. 69% f. 31% b. 31%
Greatest Importance:	c. 43% b. 20%	c. 55% b. 17%

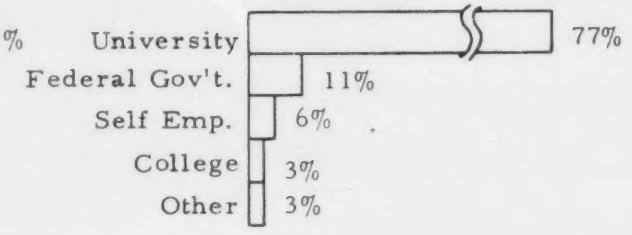
c. opportunity to work with eminent scholars
f. geographic location
b. freedom to work in field of choice

m. Career aspirations

	47 responses	35 responses

Major Factors and Frequency of Response



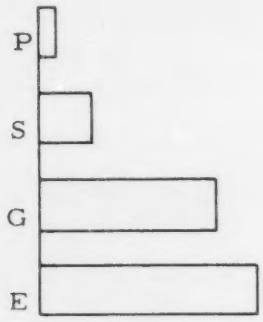


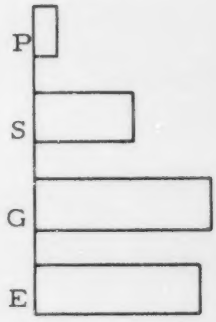
I. Postdoctoral Scholar Questionnaire (cont'd.)

General Campus & SIO

Medical School

n. Experience value





P - poor
S - satisfactory
G - good
E - excellent

Postdoctoral Scholar Survey:

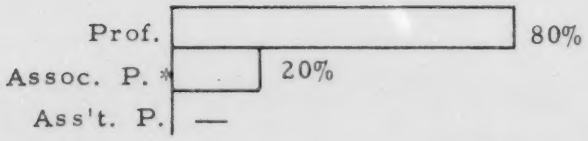
II. Principal Investigator Questionnaire

General Campus & SIO

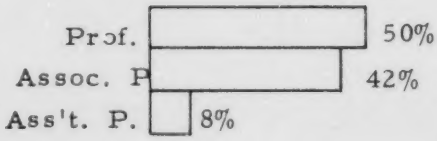
Medical School

a. Distribution of responding faculty, by rank

30 Responses

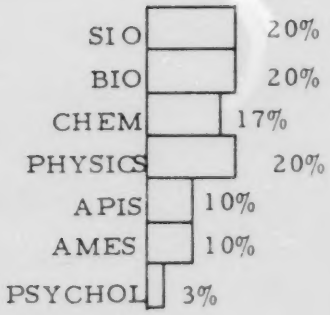


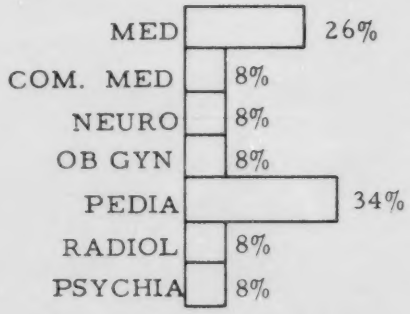
12 Responses



*Assoc. Research Oceanographer in some SIO departments.

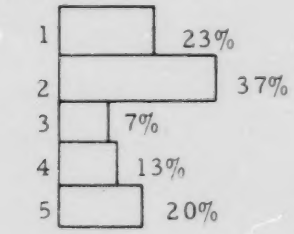
Distribution of responses by department.



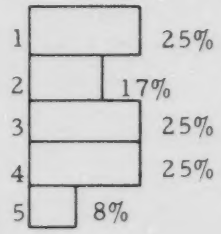


Distribution of principal investigators by number of postdoctoral scholars supervised.

Postdoctorals



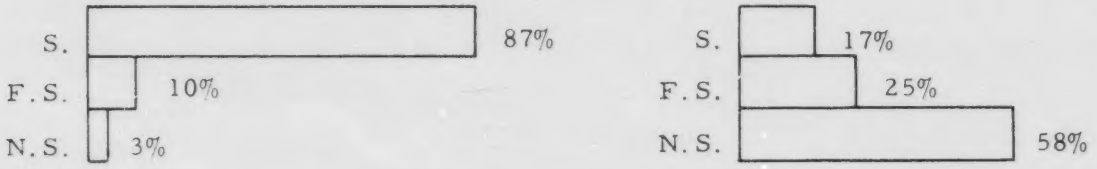
Postdoctorals



II. Principal Investigator Questionnaire (cont'd.)

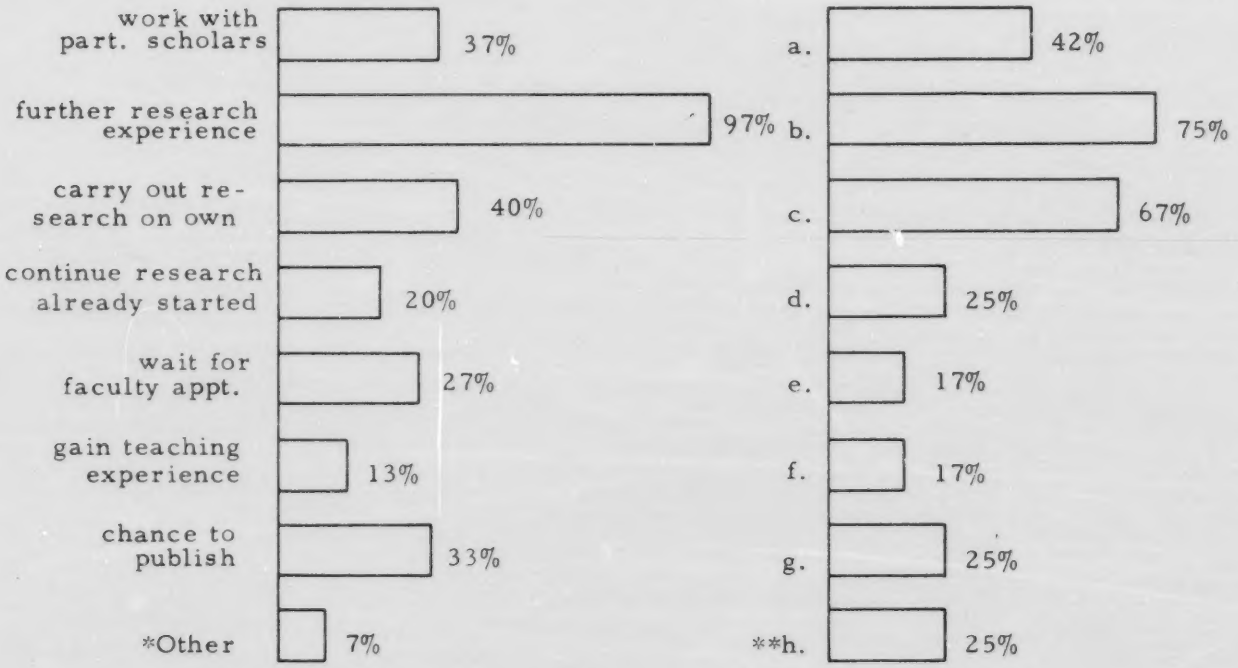
General Campus & SIO — Medical School

b. How strongly encourage better graduate students to take on postdoctoral appointment?



S. - strongly
F.S. - fairly strongly
N.S. - not strongly

c. Reasons for encouragement:
(Frequency of response with multiple response allowed)



*-broaden intellectual & experimental base

-work in environment different from graduate school & probable teaching post.

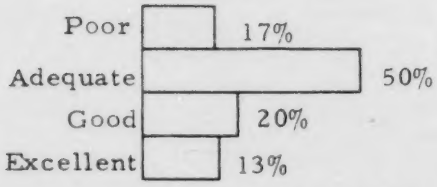
**-enhance posture as independent, critical investigator/physician

II. Principal Investigator Questionnaire (cont'd.)

General Campus & SIO

d. How well provide space and equipment?

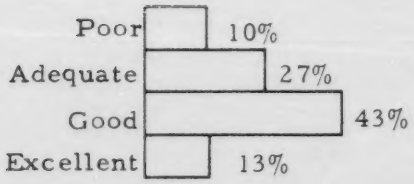
Space*



*Space needs met only after considerable effort

Space needs not recognized by state.

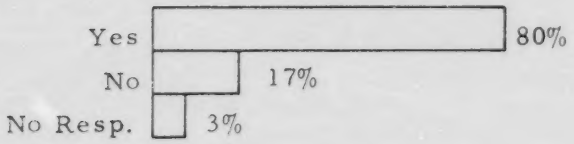
Equipment*



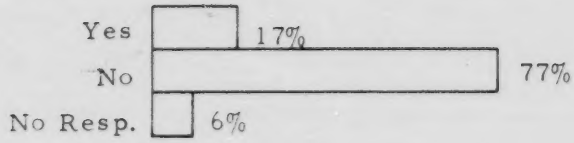
*postdoctorals have commented on insufficient and poor large scale computational facilities

e. Participation in Teaching and/or Administration should be a part of postdoctoral education?

Teaching

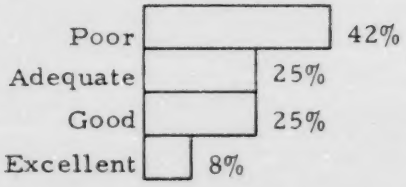


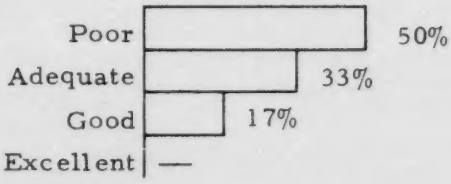
Administration

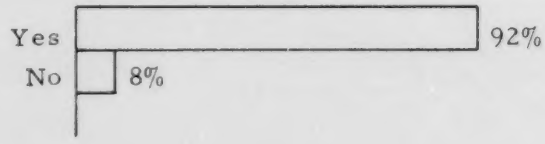


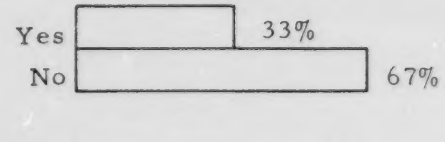
Medical School

*Space needs severe!





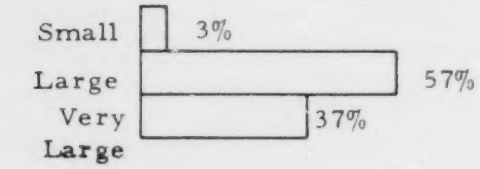


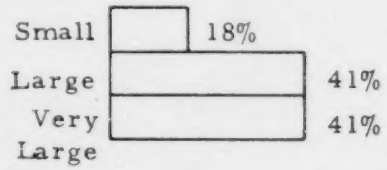


II. Principal Investigator Questionnaire (cont'd.)

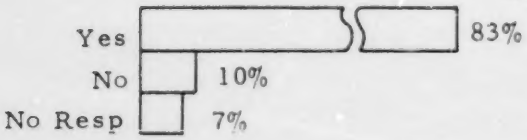
General Campus & SIO | Medical School

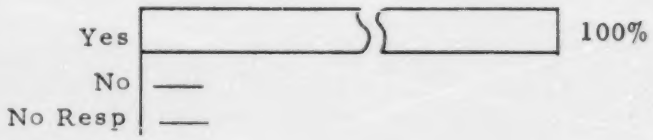
f. Postdoctoral scholars effect on quality of research.



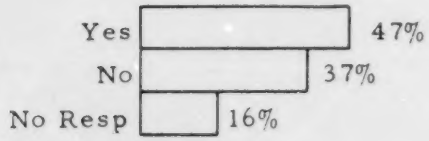


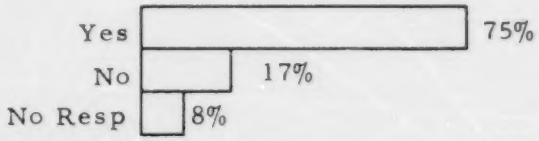
g. Increase in postdoctoral activities should be pursued at UCSD?





Even if at some cost to graduate program?





Comments

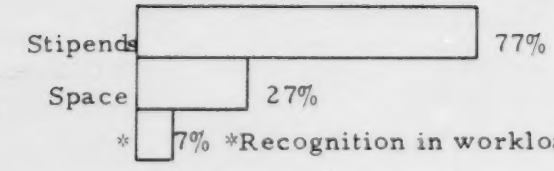
Should request partial funding by State/U.C.

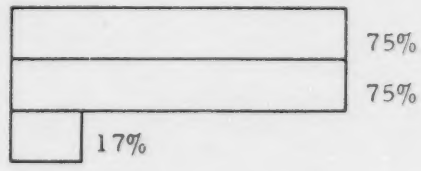
Postdoctoral education is most important neglected area of education

Recognition of workload is essential

Univ. should make some formal commitment to postdoc's. Should provide some fellowships and opportunities for assistantships.

h. Major resource requirement for significant increase in level of postdoctoral studies in your research area?
(Multiple responses allowed)



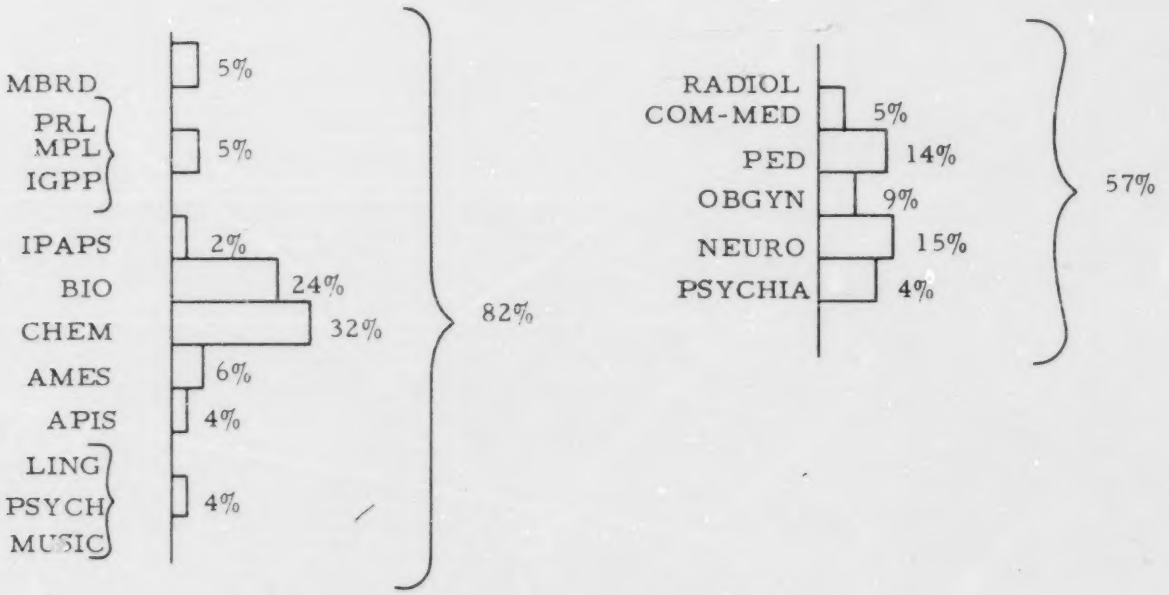


Postdoctoral Scholar Survey:

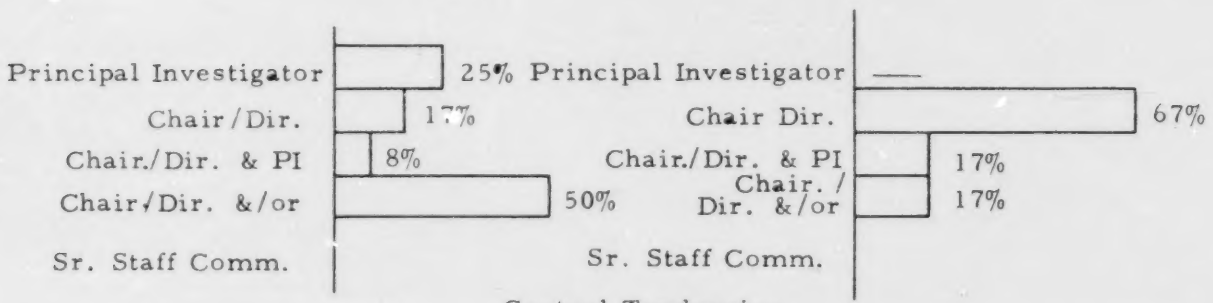
III. Department Chairman Questionnaire

General Campus & SIO — Medical School

a. Departments responding and proportion of total postdoctoral scholars represented.



b. Who reviews qualifications of prospective postdoctoral?



Central Tendencies

SIO - Chair./Dir., Sr. Staff & SIO Budget Committee

Med. School - Chairman

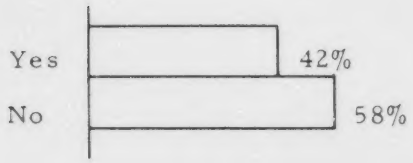
G. C. - PI for large depts.
PI & Chair. or Sr. Staff for small depts.

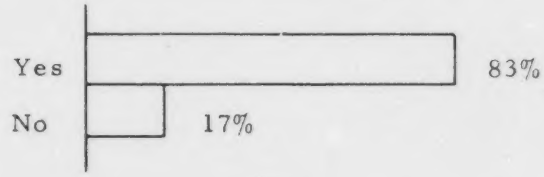
III. Department Chariman Questionnaire (cont'd)

General Campus & SIO

Medical School

c. Department keeps active file on postdoctoral scholars ?



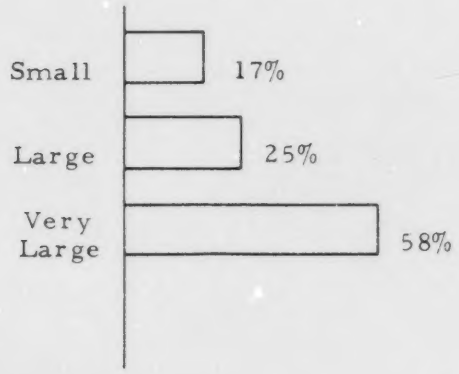


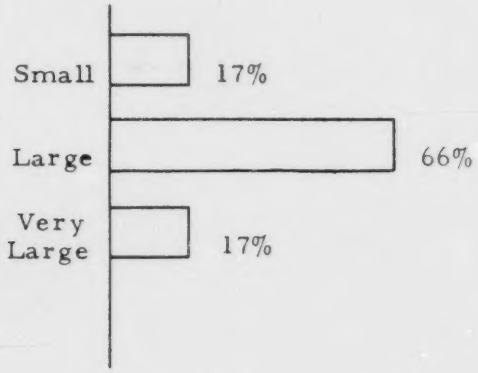
Central Tendencies

SIO - Yes
C.C. - No

Yes

d. Postdoctoral scholar's effect on quality of research ?





Central Tendencies & Comments

SIO - V. L. Especially in graduate education & student research output.

General - Campus V. L. for large depts... Fluctuates from V. L. to L. for small depts. Enormous impact on quality & extent of research

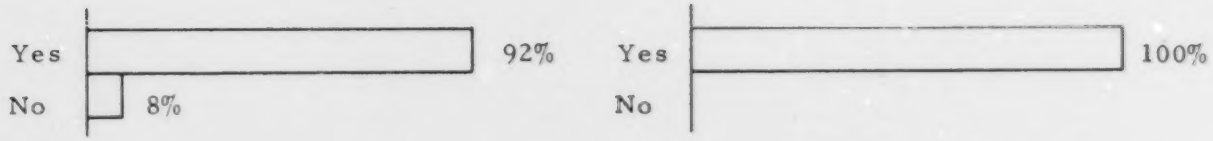
Med. Sch. - L. Backbone of dept. research program. Enhances quality of research and teaching.

III. Department Chairman Questionnaire (cont'd)

	General Campus & SIO	Medical School
e. Optimum length of stay.		
For postdoctoral's sake	1-3 yrs.*	1-3 yrs.**
For department's sake	1-3 yrs.	1-3 yrs.
OUTLIERS		
	*IPAPS - 3-5 yrs.	**NEURO - 1-4 yrs.
	CHEM - 2-5 yrs.	COM. MED. - 1-5 yrs.

f. Participation in teaching and/or administration desirable for postdoctoral training?

Teaching



Administration

g. Increased stipends needed ?

Yes — Yes

Comments

SIO - Low NIH standards make this difficult. Stipends should not be to level of asst. professor.

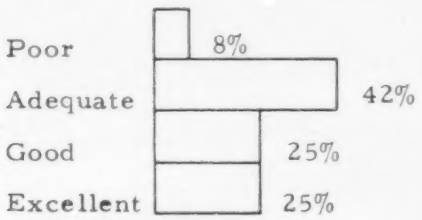
G. C. - Should be no lower than asst. professor step 1.

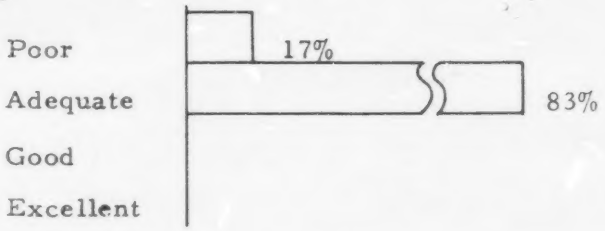
III. Department Chairman Questionnaire (cont'd)

General Campus & SIO	Medical School

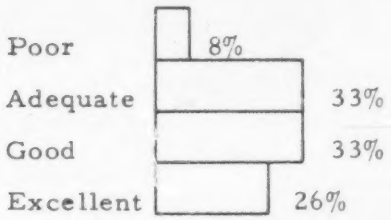
h. How well provide space and equipment ?

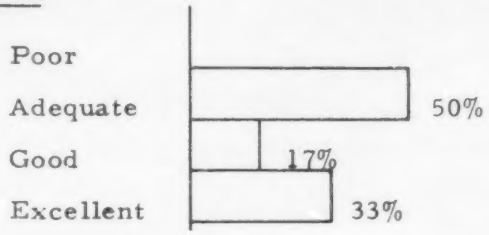
Space





Equipment

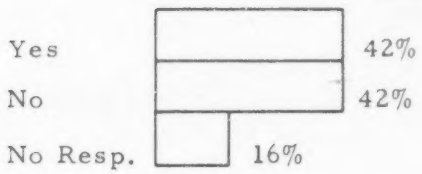


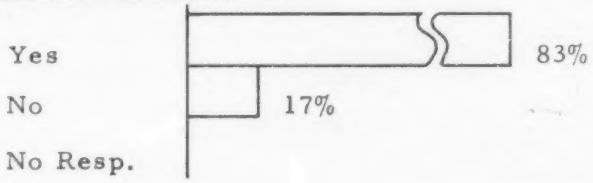


j. Should a major postdoctoral program be developed and maintained at UCSD?

Yes	Yes

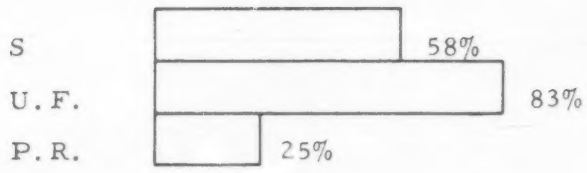
At some cost to graduate program?

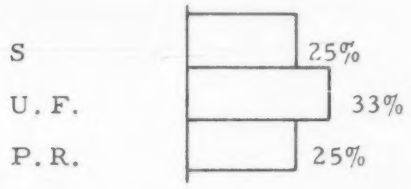




Program should consist of:
(multiple response permitted)

S - space
U.F. - umbrella funds
P.R. - public relations & advertising



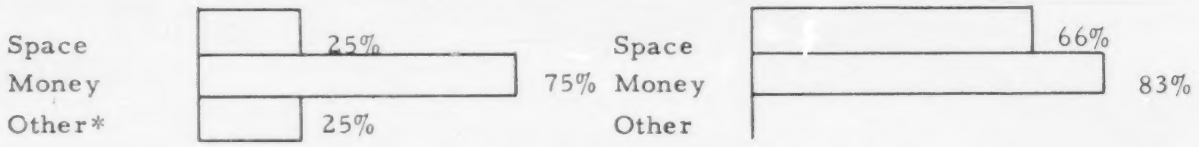


III. Department Chairman Questionnaire (cont'd)

	General Campus & SIO	Medical School

k. Major resource requirements for significant increase in level of postdoctoral studies in your department.

(multiple response permitted)



* - pressure faculty to get grants for this purpose.
- formal program.
- willingness of faculty to take on postdoctoral.

l. Postdoctoral's salary as % of salary of faculty with equivalent experience.

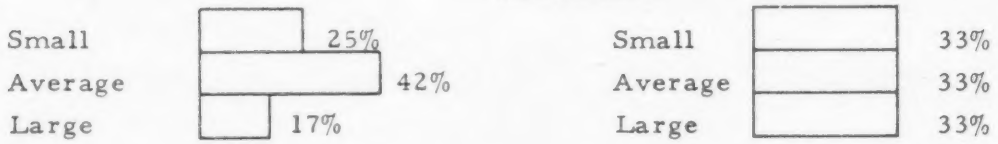
85%	45%

Comments

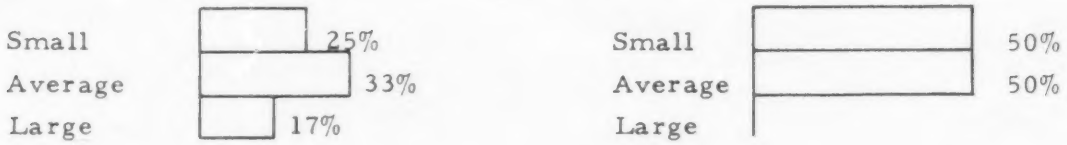
Chemistry & AMES indicate no comparitive faculty personnel.	Radiology an outlier at 100%

m. Burden of postdoctoral scholars on office staff.

Secretaries

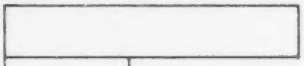


Administrative Assistants

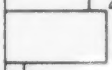
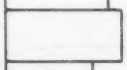
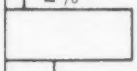
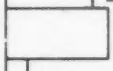


Supplies

III. Department Chairman Questionnaire (cont'd)

	General Campus & SIO		Medical School	
n. Does UCSD have administration structure to provide for needs of postdoctoral scholars?				
Yes		66%		83%
No		25%		17%

o. Previous background of last 5 full time junior faculty appointments.

	42 appointments		30 appointments	
A		20%		24%
B		24%		26%
C		2%		20%
D		30%		24%
E		11%		3%
F		9%		3%
G		2%		
H*		2%		

* Research staff at SIO

A. Faculty at another institution

B. Postdoctoral appointment at another institution

C. Postdoctoral appointment at UCSD

D. Had just completed Ph. D. or M. D. elsewhere

E. Engaged in graduate work elsewhere without yet completing a Ph. D.

F. Research in government or industry

G. Private practice

H. Other

COMMENTS EXTRACTED FROM POSTDOCTORAL SCHOLAR QUESTIONNAIRES

I POSTDOCTORAL SCHOLAR

Biology

I feel particularly fortunate to have one of the highest fellowships in non-medical research, but even so, during the first few months here I was constantly in debt. The University should recognize this as a problem and be aware that a fairly simple expedient could be made to help alleviate this. By recognizing the Fellows as members of the University community and locating them as salary receivers, the Fellows could participate in group insurance plans for car and health, and be eligible for normal University loans and services. If some form of accommodations could be undertaken for visiting Fellows from abroad for the first few weeks after their arrival at the rates of the married student apartments, for example, this would help acclimation and finance considerably. Family accommodations at La Mesa Apartments or the Coast Apartments should be considered for very low income research Fellows, perhaps in preference to unmarried student couples or leaving apartments unoccupied, as is often the case now.

Biology

Postdoctoral experience at UCSD has been worthwhile and enlightening. I feel, however, that because of the caliber of staff and research support at UCSD, many of us will take a substantial cut when we move to other institutions.

Biology

Experience at UCSD great. More can be done to aid individuals in accomplishing their objectives:

1. publish summary of current research for each department by investigator; a paragraph on what is being done by the principal investigators
2. publish an information sheet for all postdoctorals explaining what is available and how to get it, i.e., use of biology trucks, darkroom facilities, list of general department equipment and who is in charge of it
3. for postdocs interested in teaching, a place where they could indicate interest and interact with interested faculty
4. library privileges: make journals accessable to postdocs after "library hours," i.e., after 5 p.m. on Friday and Saturday

Physics	It seems to me that since postdoctorals do a significant amount of the undergraduate teaching of this institution, and since this does take time that would normally be spent on research duties, that those who pay our salaries should in some way be compensated. Major complaint is the large degree of isolation that seems to exist between various research groups.
Physics	All teaching by postdoctorals should be paid for. Foreign postdocs should be able to live in married students' apartments. This would greatly facilitate acclimation and help overcome financial hardships caused by not nearly sufficient foreign fellowships.
APIS	Several postdoctorals in department fill in as sabbatical leave replacements. By number of students, postdoctorals teach more than rest of faculty in the department. While I welcome teaching opportunity, these large classes are full-time jobs, and we are supported only 1/2 time, and then only for the duration of the quarter. No compensation for preparation required during the summer or vacation periods. This seems unfair. Also, no vacation time is accrued while being paid from sabbatical leave replacement funds.
Marine Biology Research Dept.	Lack of secretarial help a glaring fault. I saw many PhDs spending hours washing dishes, typing, making solutions, cleaning labs; all of which should be done by auxiliary help, not PhDs.
Neurosciences	Institution should accept some responsibility for future job security. We are an anonymous group employed from research funds from which the University benefits (51.5% overhead), but with employment subject to the vagaries of grant renewal at best, with only the Principal Investigator interested in our roles after the expiration of the contract. Agency needed to monitor "training" program, providing at least emergency relocation funds. There is not even a Placement Office to receive and disburse job opportunity notices of academic positions in surrounding or distant institutions, as there is at UC Berkeley. The University should not even accept postdoctorals for whom it will not accept minimal responsibility in the future.

Neurosciences	There has never been a six-month period when funds were not to be terminated, or that a new position had not to be obtained. Thus, the lack of security for a reasonable period in which to accomplish meaningful research is appalling!
	Dismayed at inability of University to effectively use skills of the postdoctorals. I have had to participate as a consultant, organize a scientific team (25 people) and prepare a proposal for one survey. (That proposal obtained a 4.5 million dollar contract for industry. Couldn't the University use money like that?)
Pediatrics	Geographic separation of Medical School from hospital poses a very real drawback. I could have been of help to the nursing staff in presenting mortality conferences. Extremely difficult to take time away from research to drive to hospital.
Bio-Med	The first year here I was not officially a part of UCSD in any way -- no staff card, no official ID, etc. An official letter of appointment from the University (regardless of the source of support) would be a friendly gesture and would help make us feel a part of the University community.
Bio-Med	Physical separation/division of departments makes contact among associates difficult and minimal. When I came here, there was no University or department effort to help me assimilate into the University environment. No chance to meet others, or to find out what services, events, etc. were available to me. Particularly true since my salary is paid directly to me. Had no opportunity to participate in the various UC programs (car/health insurance) offered to postdoctorals paid through the University payroll.

II PRINCIPAL INVESTIGATOR

Biology	a. Increase postdoc activity at expense of grad program: Rather complex question -- doubtful whether simple answer has much meaning.
	b. Comment: The present system of professional training is based on a past period of exponential growth. Obviously some adjustment is now necessary. There should be funding

for senior research workers to allow the maintenance of viable research groups in universities.

Biology

a. Comment:
Postdoctoral training should be given the dignity of recognition as a significant educational and research activity of the campus and of the University as a whole. Our postdoctoral scholars should have privileges accorded to them, such as medical care, insurance, and housing facilities; and, their presence should be weighed in the formulae by which faculty loads and faculty/student ratios are determined. They should be treated with special deference, instead of the current official indifference, because they will go onto man the faculties of universities all over the country, and are potentially a great resource for graduate and postgraduate students for the future.

Physics

a. Comment:
Partial funding should be requested from State and/or UC funds. In the allocation of funds, FTEs, space, etc., the number of postdocs in a department should be taken into account.

Physics

a. Comment:
At present, I am forced to emphasize graduate training since graduate students require much smaller salaries.

APIS

a. Comment:
More research interaction should be encouraged.

AMES

a. Comment:
Formal UC recognition that postdoctoral education is an important function. Teaching credit for faculty members with postdoctorals. Establishment of a formal university program, with some sort of suitable postdoctoral certificate at the end.

AMES/Med

a. Comment:
Recognize the existence of postdocs on campus. Provide them with some office and laboratory space. Give postdoc education a position (some credit) in figuring departmental teaching load. Recognize as legitimate workload for faculty.

AMES

a. Comment:
I believe some reliable and preferably long-term salary financing is needed far more than facilities or space, although all three are important.

SIO

a. Comment:
If people want to encourage an educational program for recipients of a Ph.D., a specific category of "postdoctoral fellow" should be established to distinguish these people from junior members of the permanent research staff. The present system degrades the latter group.

Medicine

a. Comment:
The School of Medicine has specific needs in this regard. Postdoctorals are an important component of the teaching/research/patient care team. Without them, expansion of other team components will be needed and, of course, the postdoc development as of future faculty will not occur.

Com Med

a. Comment:
Need formal programs in various disciplines or in interdisciplinary fields.

Academic credit for course work that can be applied to different degrees or other credentials.

OB GYN

a. Comment:
Best spent money in this area in the past has come from the MACI Foundation. Private foundations, rather than PHS, should be persuaded to support postdoctoral fellows in future.

Pediatrics

a. Comment:
"It is ironic, that I cannot accept anyone with any assurance of funds for 1974, due to Nixonian economics."
The UC system (or state) should sponsor fellowships in competition.

Psychiatry

a. Comment:
There should be University sponsored postdocs on a competitive basis.

III DEPARTMENT CHAIRMEN

Marine Biology Research Dept.

a. Teaching and Administration:
Administration should be minimal.

b. Allocation of Resources:
This division has received many applications for highly qualified scientists who would gain immensely from a visit here as well as contribute to graduate education and staff research. It is a pity that more cannot be accommodated. Stipend support is the main limitation.

Marine Physical Laboratory

a. Teaching and Administration:
Nature of physical plant makes teaching opportunities very limited. (By "nature of physical plant," the Chairman means the physical location of his department's office and the lack of teaching facilities. This particular department/unit is solely research in nature.)

Neurosciences

a. Teaching and Administration:
Administration in the sense of involvement with dispensing grant funds he is concerned with, planning future projects, and acting as an ad hoc consultant on reviews of proposals, manuscripts sent to the P.I.

b. Increased Stipends:
The present level of support for a postgraduate neuroscientist is ridicuously low. This results in appointment of postdocs as Asst. Research Neuroscientists at a salary that is equivalent to Asst. Prof. -- too high.

c. Comment:
It appears we will have to fund postdocs almost exclusively on project grants in the future. With limitation of research funds, choices have to be made between postdoc support and technician support. As I see it, postdocs are being let go before technicians. In order to maintain postdoc programs, more support is vital.

APIS

a. Comment:
I think that postdoctoral education is of growing importance in educational development. Formalizing a postdoctoral guidance could enhance the benefits to both the scholar and to the department. Administrative endorsement of such a program, coupled with minimal support,

could go a long way towards developing an effective extension of postgraduate education.

Psychology

a. Comment:
I have mixed feelings -- good if it really provides extra training or expansion -- bad if it merely serves to delay a career. I do not want a gigantic postdoctoral program, but certainly do not object to any department that does want one -- provided, of course, that they tend to their primary responsibility: the colleges and the graduate school.